

Amendments to the Claims:

This listing of claims will replace all prior versions and listings of claims in the application. Claims that were withdrawn by the Examiner in the Office Action dated May 11, 2005 are shown in their amended form following the entry of the Response dated March 29, 2004, and are indicated as withdrawn below. Claims 13, 14 and 55 are currently amended. New claims 57, 58 and 59 have been added. Support for the new claims and for the amendments to the previously presented claims is found in the specification as originally filed, and is discussed further in the REMARKS starting on page 6. These amendments are made without prejudice and are not to be construed as abandonment of the previously claimed subject matter, or agreement with any objection or rejection of record.

Listing of Claims:

1. (withdrawn) A cell that expresses a *Moraxella bovis* cytotoxin or a cytotoxin fragment encoded by a recombinant nucleic acid molecule comprising the nucleotide sequence of SEQ ID NO: 1 deposited at GENBANK database under Accession number AF205359 or a modified variant thereof, wherein said cytotoxin fragment is specifically bound by an antibody that specifically binds a full-length *Moraxella bovis* cytotoxin encoded by SEQ ID NO: 2.
2. (withdrawn) The cell of claim 1, wherein the cytotoxin or cytotoxin fragment is obtained, purified and isolated from a culture comprising said cell.
3. (withdrawn) The cell of claim 2, wherein said culture comprises a culture supernatant and wherein said cytotoxin or cytotoxin fragment is isolated from the culture supernatant by centrifugation, filtration, concentration and diafiltration.
4. (withdrawn) The cell of claim 3, wherein said diafiltration produces a diafiltered retentate and a diafiltered permeate, wherein said diafiltered retentate is enriched for the cytotoxin or cytotoxin fragment relative to the diafiltered permeate.
5. (cancelled)
6. (withdrawn) The cell of claim 4, wherein said cytotoxin or cytotoxin fragment causes lysis of bovine lymphocyte cells.
- 7-11. (cancelled)
12. (withdrawn) The cell of claim 1, wherein said cytotoxin comprises the amino acid sequence depicted by SEQ ID NO: 2 .
13. (currently amended) An isolated peptide consisting of the amino acid sequence depicted by SEQ ID NO: 6.
14. (currently amended) An isolated peptide consisting of the amino acid sequence depicted by SEQ ID NO: 13.

- 15-33. (cancelled)
34. (withdrawn) An anti-*Moraxella bovis* vaccine consisting essentially of a cytotoxin or cytotoxin fragment provided in claim 2.
35. (withdrawn) The vaccine of claim 34 wherein said cytotoxin or cytotoxin fragment is formulated in admixture with an adjuvant.
36. (withdrawn) The vaccine of claim 35 wherein said adjuvant is an immunostimulating (ISCOM) matrix.
37. (withdrawn) The vaccine of claim 36 wherein said ISCOM matrix comprises *Quillaja* saponins, cholesterol and phospholipids.
38. (withdrawn) The vaccine of claim 37 wherein said cytotoxin or cytotoxin fragment is mixed with said adjuvant in a 1 to 1 volume ratio.
39. (withdrawn) The vaccine of claim 38 wherein 1 ml of the adjuvant is mixed with 1 ml of a solution comprising the cytotoxin or cytotoxin fragment.
40. (withdrawn) The vaccine of claim 39 wherein said solution comprises 0.5 mg/ml of the cytotoxin or cytotoxin fragment.
41. (withdrawn) The vaccine of claim 34, wherein the cytotoxin fragment comprises the amino acid sequence depicted by SEQ ID NO: 6.
42. (withdrawn) The vaccine of claim 41 wherein said cytotoxin fragment is formulated in admixture with an adjuvant.
43. (withdrawn) The vaccine of claims 42 wherein said adjuvant is an immunostimulating (ISCOM) matrix.
44. (withdrawn) The vaccine of claim 43 wherein said ISCOM matrix comprises *Quillaja* saponins, cholesterol and phospholipids.
45. (withdrawn) The vaccine of claim 34, wherein the cytotoxin fragment comprises the amino acid sequence depicted by SEQ ID NO: 13.
46. (withdrawn) The vaccine of claim 45 wherein said cytotoxin fragment is formulated in admixture with an adjuvant.
47. (withdrawn) The vaccine of claims 46 wherein said adjuvant is an immunostimulating (ISCOM) matrix.
48. (withdrawn) The vaccine of claim 47 wherein said ISCOM matrix comprises *Quillaja* saponins, cholesterol and phospholipids.
- 49-50. (cancelled)
51. (withdrawn) The cell of claim 1, wherein said cell is a bacterial cell.

52. (withdrawn) The cell of claim 1, wherein said recombinant nucleic acid molecule comprises an expression vector.

53. (withdrawn) The cell of claim 1, wherein said cytotoxin or cytotoxin fragment has a molecular weight of about 95 or 98 kDa.

54. (withdrawn) The cell of claim 4, wherein said diafiltered retentate is fractionated using gel filtration chromatography.

55. (currently amended) A composition comprising a polypeptide, wherein the polypeptide ~~comprises a fragment of the amino acid sequence of SEQ ID NO: 2, wherein the fragment is shorter than the full length amino acid sequence of SEQ ID NO: 2, and wherein the fragment is selected from:~~

- a) a polypeptide fragment that is capable of stimulating antibody production in an animal, wherein the antibodies produced by the animal specifically bind the polypeptide of SEQ ID NO: 2 and where the polypeptide comprises a subsequence heterologous to the *M. bovis* cytotoxin polypeptide of SEQ ID NO: 2;
- b) a polypeptide fragment that displays bovine lymphocyte cytolytic activity, wherein the polypeptide is shorter than the polypeptide provided by SEQ ID NO: 2;
- c) a polypeptide fragment that displays hemolytic activity, wherein the polypeptide is shorter than the polypeptide provided by SEQ ID NO: 2;
- d) a polypeptide fragment that displays corneotoxic activity, wherein the polypeptide is shorter than the polypeptide provided by SEQ ID NO: 2;
- e) ~~the fragment of (a) comprising any combination of (b), (c) or (d);~~
- e f) a polypeptide comprising amino acids 438 through 713 of SEQ ID NO: 2, inclusive, wherein the polypeptide is shorter than the polypeptide provided by SEQ ID NO: 2;
- f g) a polypeptide comprising amino acids 590 through 927 of SEQ ID NO: 2, inclusive, wherein the polypeptide is shorter than the polypeptide provided by SEQ ID NO: 2;
- and,
- g h) a polypeptide comprising amino acids 643 through 927 of SEQ ID NO: 2, inclusive, wherein the polypeptide is shorter than the polypeptide provided by SEQ ID NO: 2.

56. (previously presented) The composition of claim 55, wherein the composition is immunogenic.

57. (new) The composition of claim 55, wherein said subsequence of the polypeptide of (a) is a 6xHis tag.

58. (new) The composition of claim 55, wherein the polypeptide of (b), (c), (d), (e), (f) or (g) comprises a 6xHis tag.

59. (new) The composition of claim 55, wherein the polypeptide of (a), (b), (c), (d), (e), (f) or (g) is a fusion polypeptide.